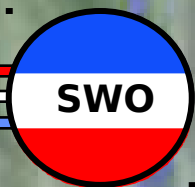




2006 Hurricane Briefing



Overview

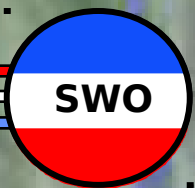
- ❖ US Hurricane History - The costliest, deadliest, the most intense
- ❖ **Atlantic Hurricane Season / Atlantic Basin Formation Areas**
- ❖ **US Mainland/Army Posts Strikes Since 1900**
- ❖ **Caribbean Hurricanes Since 1900**
- ❖ **Saffir-Simpson Hurricane Scale**
- ❖ **2005 Atlantic Hurricane Summary**
- ❖ **Drs. Klotzbach and Gray's 2006 Atlantic Basin Forecast**
- ❖ **2006 Atlantic Tropical Storm Names**



US Hurricane History The Costliest



- ❖ The third most expensive hurricane to hit the US was Charley, which caused \$15.4 billion worth of damage in 2004. It was followed a few weeks later by Hurricane Ivan moving into the number four position with \$14.9 billion



US Hurricane History The Costliest



A Times Picayune Photo

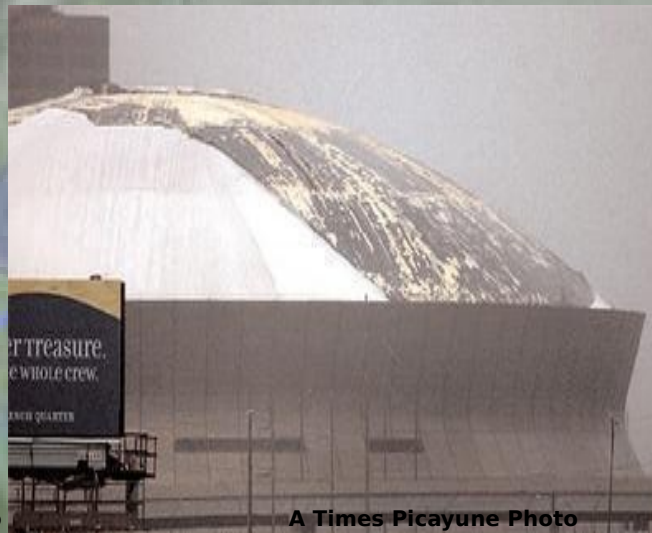


A Times Picayune Photo

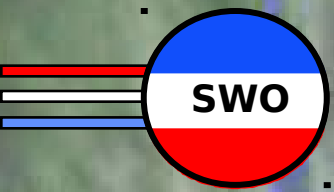
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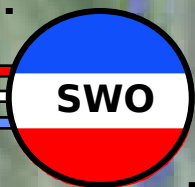
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- ❖ In 1998, Hurricane Mitch killed between 11,000 and 18,000 people in Central America, mostly by flooding and mudslides
- ❖ The deadliest hurricane to hit the US was in Galveston, Texas in 1900
 - ❖ Claimed at least 8000 lives
 - ❖ Actual deaths may have been as high as 10,000 to 12,000



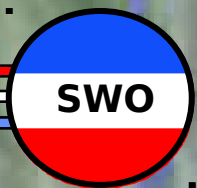
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The Most Intense

- ❖ Intensity of a storm is based on its lowest central pressure



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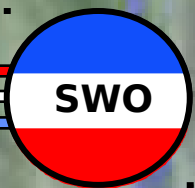
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- ❖ Three of the most intense hurricanes ever measured occurred in 2005:

- (1) Wilma - 882 mb
- (4) Rita - 897 mb
- (6) Katrina - 902 mb



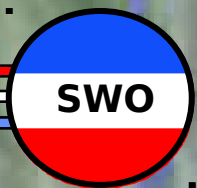


US Hurricane History

The Strongest at US Landfall

- ❖ In 1935, the Florida keys were struck by the Category 5 “Labor Day” hurricane. Sustained winds were estimated to be between 185 and 200 mph





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- ❖ In 1969, when Hurricane Camille struck the Gulf coast near the mouth of the Mississippi river, it was near its maximum strength, with sustained winds near 190 mph
- ❖ Caused over \$5 billion in damages and claimed 256 lives





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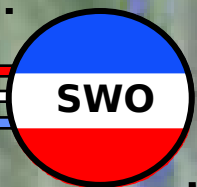


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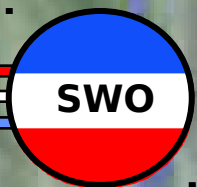
- ❖ Caused nearly \$45 billion in damages
- ❖ Hurricane Charley in 2004 matched Andrew’s strength at landfall, with 145 mph sustained winds as it hit the central Florida Gulf coast near Punta Gorda



Saffir-Simpson Hurricane Intensity Scale

- ❖ Category rating (1-5) is based on sustained wind speed
- ❖ Represents hurricane's current strength
- ❖ Categories 3-5 are considered major hurricanes
- ❖ Provides estimate of potential property damage & flooding expected in landfall area
- ❖ Storm surge estimates depend upon slope of

Category	1	2	3	4	5
Wind speed (mph)	74-95	96-110	111-130	131-155	156 or more
Storm Surge (feet)	4-5	6-8	9-12	13-18	19 or higher

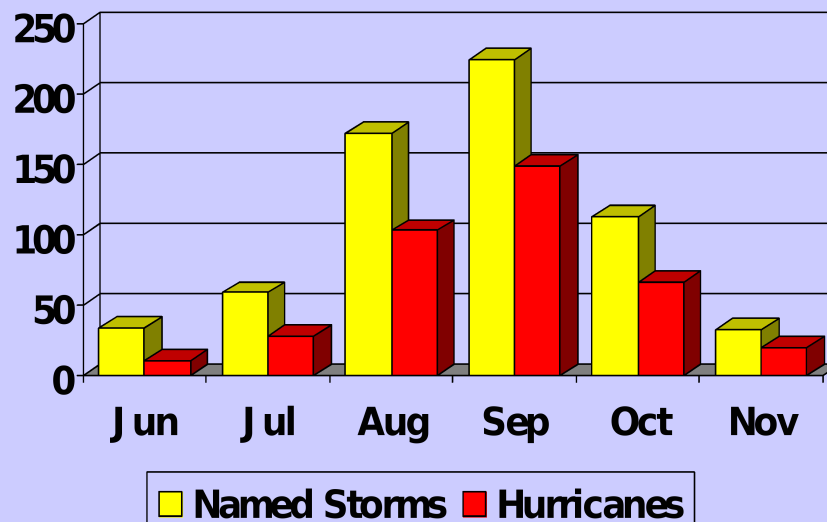


Atlantic Hurricane Season

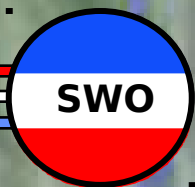
Season officially begins June 1st and ends November 30th

- ❖ Majority of storms occur during August and September
- ❖ Most named storms last from 2 to 10 days
- ❖ In 2003, Tropical Storm Ana formed in April, and two tropical storms formed in December
- ❖ Tropical Storm Zeta in 2005 was the second named storm ever to form in December and last into January

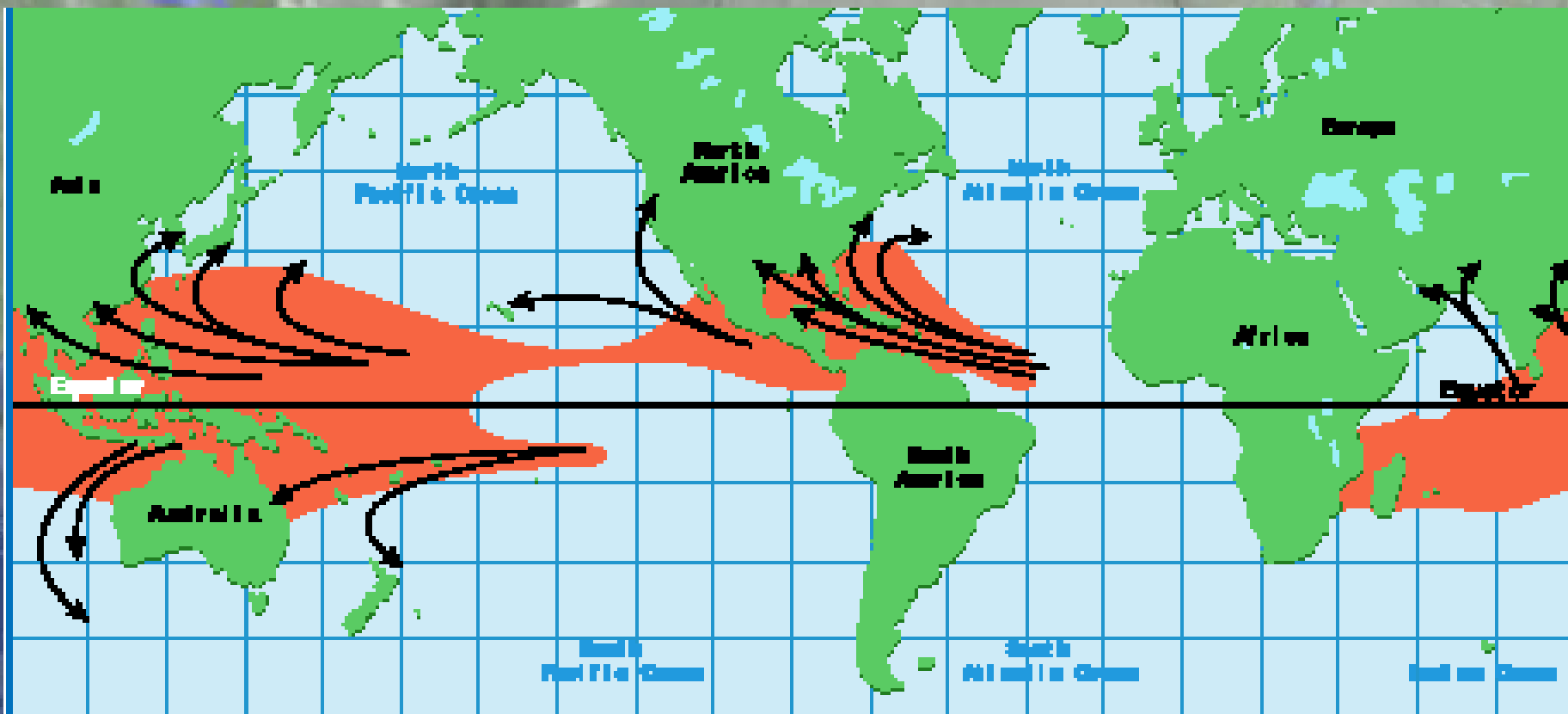
Number of Atlantic Basin Storms by Month, 1944-2005



- ❖ **A Tropical Storm becomes a Hurricane when winds reach 74 mph or greater**



Where Hurricanes Form



Hurricanes are products of a tropical ocean and a warm, moist atmosphere. They are typically steered by high-level easterly winds while south of 25° north latitude, and by high-level westerly winds north of 25° north latitude.

Source: National Weather Service hurricane preparedness guide



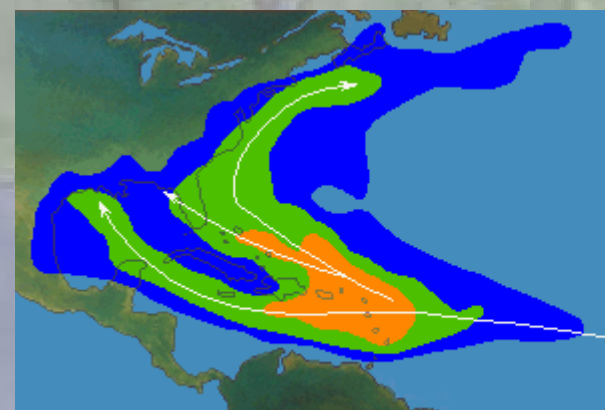
Storm Location by Month



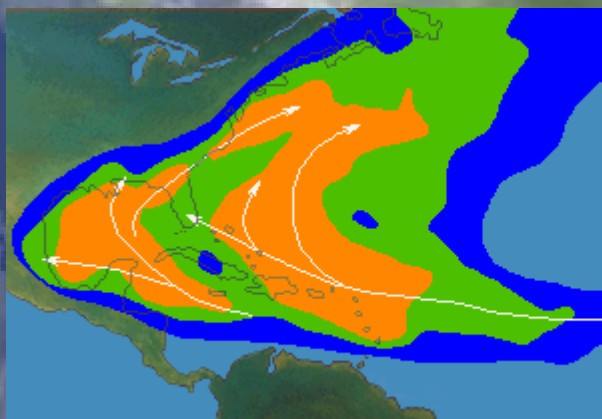
June Average
<1 Storm per Season



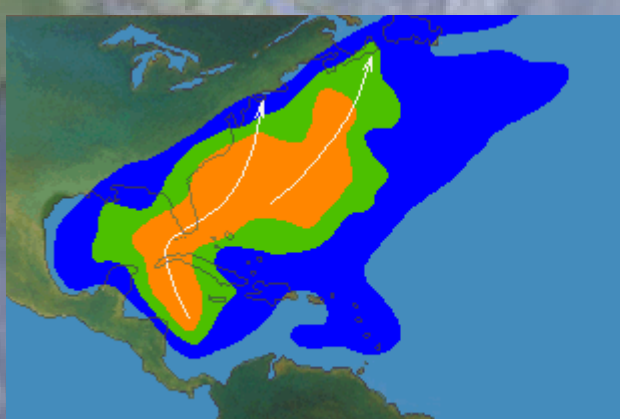
July Average
1 Storm per Season



August Average
2.8 Storms per Season



September - Average
3.6 Storms per Season



October- Average
1.8 Storms per Season



November - Average
<1 Storm per Season



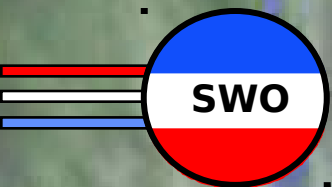


CONTINENTAL UNITED STATES HURRICANE STRIKES 1950 - 2005



NOAA'S NATIONAL CLIMATIC DATA CENTER, ASHEVILLE, NORTH CAROLINA

Protecting the past... Revealing the future

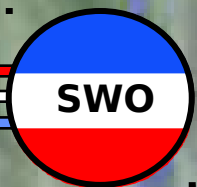


US Mainland Army Posts

Strikes since 1851

A "Strike" is counted as at least tropical-storm-force winds within 65 miles of the post

Number of:	Tropical storms	Hurricanes			Storms per 100 years
		Category 1	Category 2	Category 3 or 4	
Fort Stewart	56	10	3	5	48
Camp Blanding	42	16	2	2	40
Fort Bragg	41	5	3	3	34
Fort Eustis	39	4	1	0	28.5
Fort Benning	30	4	1	0	23
Fort Dix	23	3	1	0	17.5
Fort Polk	13	4	4	1	14
Fort McPherson	16	1	0	0	11
Fort Hood	11	1	1	0	8
Fort Sam Houston	10	3	0	1	9
Fort Campbell	5	0	0	0	3



Caribbean Hurricanes

1900-2004

Number of Hurricanes

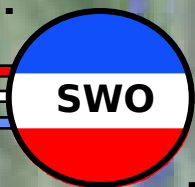
Within 60 Miles of Land Mass
> 30 (Red)

21-30
(Orange)

10-20
(Yellow)

< 10
(Green)





The 2005 Atlantic Hurricane Season

	2005	Average Season
Named Storms	27 (record)	10
Hurricanes	15 (record)	6
Major Hurricanes (Category 3, 4, or 5)	7	2
Category 5 Hurricanes	4 (record)	Less than 1

Other records set in 2005:

- ❖ Most category 5 hurricanes to hit the US in one season (four)
- ❖ Most tropical storms in one season before August 1st (seven)
- ❖ Costliest US hurricane (Katrina, 75-80 billion dollars)
- ❖ Most intense hurricane ever measured (Wilma, 882 mb central pressure)
- ❖ Latest ending hurricane season (Tropical Storm Zeta dissipated Jan 6, 2006)



The 2005 Atlantic Hurricane Season

The Big Storms of 2005

- ❖ Hurricane **Dennis** became the strongest July storm on record when its central pressure dropped to 930mb while it was a category four hurricane. It struck Cuba before making landfall on the Florida Panhandle. Dennis killed 88 people and caused \$4.6 billion in damages



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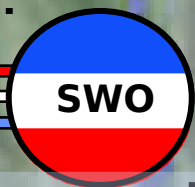
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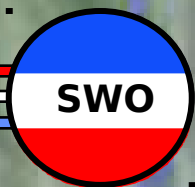
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- ❖ The strongest tropical cyclone on record in the Atlantic basin was Hurricane **Wilma**, with 185 mph winds and a central pressure of 882mb. Wilma became the record-setting fourth category five storm to form in one season. It struck Quintana Roo in Mexico as a category four, and south Florida as a category three, causing \$16-20 billion in damages and 22 deaths.



Recent Major Hurricanes

Category 3

Sustained winds 111-130 mph, Storm surge generally 9-12 ft above normal

2004: Jeanne (120 mph)

1998: Bonnie (115 mph)

1996: Fran (115 mph)



Recent Major Hurricanes

Category 4

Sustained winds 131-155 mph, Storm surge generally 13-18 ft above normal

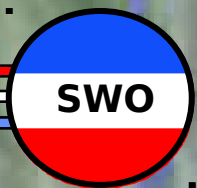
2005: Dennis (150 mph)

2004: Charley (150 mph), Frances (145 mph), Karl (145 mph)

2002: Lili (145 mph)

1999: Bret (145 mph), Floyd (155 mph)

1995: Opal (145 mph)



Recent Major Hurricanes

Category 5

Sustained winds greater than 155 mph, Storm surge generally greater than 18 ft above normal

2005: Emily (160 mph), Katrina (175 mph), Rita (180 mph), Wilma (185 mph)

2004: Ivan (165 mph)

2003: Isabel (165 mph)

1998: Mitch (180 mph)

1992: Andrew (175 mph)



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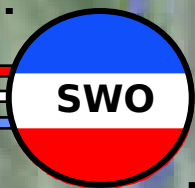
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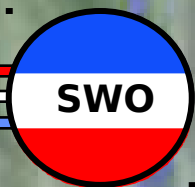
1992: Andrew (175 mph)



2006 Atlantic Basin Forecast

by Drs. Klotzbach and Gray

“We foresee another very active Atlantic basin tropical cyclone season in 2006. However, we do not expect to see as many landfalling major hurricanes in the United States as we have experienced in 2004 and 2005.”



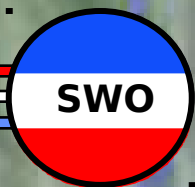
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**2006
Average
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❖ **Named Storms**



2006 Atlantic Basin Forecast

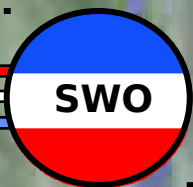
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**2006
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❖ Named Storms	17
❖ Hurricanes	9

❖ Named Storms
❖ Hurricanes
5.9

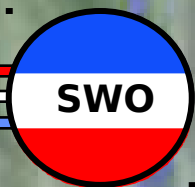


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	2006 Average Forecast Season	
❖ Named Storms	17	9.6
❖ Hurricanes	9	5.9
❖ Intense Hurricanes (Category 3, 4, or 5)	5	2.3



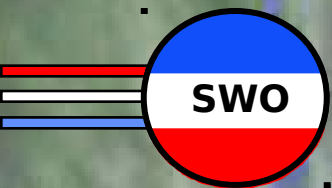
2006 Atlantic Basin Forecast

by Drs. Klotzbach and Gray

**Forecast probability of a major hurricane
(winds faster than 111 mph) hitting the
U.S. Coast in 2006.**

Location	2006 Forecast	Century average
Entire US Coastline	81%	52%
East Coast and Florida peninsula	64%	31%
Gulf Coast excluding Florida peninsula	47%	30%

Source: Colorado State University



2006 Atlantic Basin Tropical Cyclone Names

Alberto

Beryl

Chris

Debby

Ernesto

Florence

Gordon

Helene

Isaac

Joyce

Kirk

Leslie

Michael

Nadine

Oscar

Patty

Rafael

Sandy

Tony

Valerie

William





Hurricane Briefing Sources

- ❖ **THE DEADLIEST, COSTLIEST, AND MOST INTENSE UNITED STATES TROPICAL CYCLONES FROM 1851 TO 2004 (AND OTHER FREQUENTLY REQUESTED HURRICANE FACTS)**, Updated August 2005 by Eric S. Blake, Jerry D. Jarrell (retired), and Edward N. Rappaport NOAA/NWS/Tropical Prediction Center/National Hurricane Center Miami, Florida Christopher W. Landsea NOAA/AOML/Hurricane Research Division Miami, Florida.
- ❖ **The National Hurricane Center website**
- ❖ **NOAA REVIEWS RECORD-SETTING 2005 ATLANTIC HURRICANE SEASON**, National Oceanographic and Atmospheric Administration
- ❖ **EXTENDED RANGE FORECAST OF ATLANTIC SEASONAL HURRICANE ACTIVITY AND U.S. LANDFALL STRIKE PROBABILITY FOR 2006**, Philip J. Klotzbach and William M. Gray with special assistance from William Thorson, Department of Atmospheric Science, Colorado State University

Hurricane Links

National Hurricane Center's Tropical Prediction Center
Go to 2d Weather Flight's Homepage